COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
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APPROVAL FOR REMEDIAL USE

Pursuant to Title, 310 CMR 15.00

Name and Address of Applicant:

Orenco Systems, Inc.
814 Airways Avenue
Sutherlin, OR 97479

Trade name of technology and model: AdvanTex Treatment System Models AX-15, AX-20 and AX-100 (hereinafter called the "System"). Schematic drawings of typical AX-15, AX-20 and AX-100 units are attached and are a part of this Approval.

Date of Application:	May 9, 2002
Transmittal Number:	W 028049
Date of Issuance:	January 30, 2003, modified December 16, 2005
Expiration date:	January 30, 2008

Authority for Issuance

Pursuant to Title 5 of the State Environmental Code, 310 CMR 15.000, the Department of Environmental, Protection hereby issues this Approval for Remedial Use to: Orenco Systems, Inc., 814 Airway Avenue, Sutherlin, OR 97479 (hereinafter "the Company"), approving the System described herein for Remedial Use in the Commonwealth of Massachusetts. Sale and use of the System are conditioned on compliance by the Company and the System owner with the terms and conditions set forth below. Any noncompliance with the terms or conditions of this Approval constitutes a violation of 310 CMR 15.000.

December 16, 2005
Date

Glenn Haas, Director
Division of Watershed Management
Department of Environmental Protection

I. Purpose

1. The purpose of this approval is to allow use of the System in Massachusetts, on a Remedial Use basis.

2. With the necessary permits and approvals required by 310 CMR 15.000, this Approval for Remedial Use authorizes the use and installation of the System in Massachusetts.

3. The System may only be installed on facilities that meet the criteria of 310 CMR 15.284(2).

4. This Approval for Remedial Use authorizes the use of the System where the local approving authority finds that the System is for upgrade of a failed, failing or nonconforming system and the design flow for the facility is less than 10,000 gallons per day (GPD).

II. Design Standards

1. The System is a multi-pass, packed bed aerobic wastewater treatment system designed to treat residential strength wastewater from facilities with a design flow of less than 10,000 GPD. The System is comprised of a pre-assembled, UV-protected fiberglass reinforced plastic (FRP) module that contains a textile media, installed on top of a two compartment septic tank, designed in accordance with 310 CMR 15.223 and 15.226 with sufficient volume above the high water level to store one days design flow. The minimum 1500-gallon Processing Tank shall be sized according to the Company's design criteria. The first compartment receives and separates the raw sewage into three zones: a scum zone, a sludge zone and a clear zone. A flow-through port in the tank baffle wall allows effluent from the clear zone into the second compartment of the tank. A Biotube Pump Package installed in the second compartment pumps effluent to a pressure distribution manifold located on top of the filter module. The effluent is applied at a preset recirculation ratio of 4:1, controlled by a timer. Timer settings can be recalibrated if flows vary significantly from projected flows. Effluent from the filter module flows in part or totally to the Processing Tank or to an external pump chamber. During extended periods of low flow, all of the treated effluent is returned to the Processing Tank or external pump chamber.

2. The Biotube Pump Package controls shall be equipped with a high water level override and high water alarm set three inches higher than the high water setting. The alarm and control circuits shall each be connected to an independent power source run from the main power source of the facility. The Biotube Pump shall be designed to allow all pipelines to drain back into the processing or recirculation tank. The Biotube Pump Package shall be equipped with a removable filter cartridge that is equivalent to a septic tank effluent tee filter.

3. Systems designed for residential facilities in excess of six bedrooms shall require the installation of a separate septic tank constructed in accordance with 310 CMR 15.223 through 15.226 and sized at a minimum of 2.2 times the design flow and a separate Processing or recirculation tank equal to the design flow of the facility or a minimum of 1000 gallons. Single or multiple System units can be used in combination to serve various sized or multiple

facilities. Multiple unit designs and any design using AX-100 units shall include septic tank(s) sized and constructed in accordance with 310 CMR 15.223 through 15.226. The septic tank(s) shall be located prior to the filter module and shall include a Processing or recirculation tank sized in accordance with the Company's design criteria.

4. System modules contain an effluent distribution system and proprietary textile polyester-based media. Filtrate flows through a conveyance pipe (under drain) to a flow-splitting valve and discharges to the Biotube chamber in the Processing or recirculation tank or the effluent pump chamber. The treated effluent is discharged to the effluent pump chamber for pressure distribution to the soil absorption system (SAS). The modules shall be equipped with UV-protected, removable FRP composite lids. System units shall have one inch of insulation attached to the bottom of the lid.

5. The System, including a properly sized septic tank, shall be installed between the building sewer and the effluent pump chamber for disposal in the SAS of a system designed and constructed in accordance with 310 CMR 15.100 - 15.279, subject to the provisions of this Approval.

6. The System shall be equipped with a Vericomm® control panel (CP). This CP shall be equipped with an Internet web based interface that provides continuous monitoring, maintenance, management and control of each individual system. The CP shall provide the designated operation and maintenance (O&M) provider with the information to manage incoming alarms 24 hours per day through automatic notification, preestablished alarm protocol, an online list of all active alarms, online diagnostic data and online input and review of alarm responses. The CP shall provide for site management through editable online information, an online tabular display of all operating data and shall provide standard and custom reports. The CP unit shall transmit report information to the O&M provider and the manufacturer of the System.

7. The System shall be monitored using AdvanTexdealer.com, a web based program used to track and update all sites, manage contact information, generate and print reports and audit checklists.

8. The System may be used in soils with a percolation rate of up to 90 minutes per inch (MPI). For soils with a percolation rate of 60 to 90 MPI, the effluent loading rate shall be 0.15 gpd / sq. ft.

III. Allowable Soil Absorption System Design

1. Reduction of the Required Soil Absorption System Size - In approving design and installation of the System by a particular Applicant, the approving authority may allow up to a 50 percent reduction in the area of the soil absorption system required by 310 CMR 15.242, provided that all of the following conditions are met:

   A. No reduction in the required separation (four feet in soils with a recorded percolation rate of more than two minutes per inch or five feet in soils with a recorded percolation rate of two minutes or less per inch) between the bottom of the stone underlying the SAS and the high groundwater elevation is allowed unless such a reduction is approved by the approving authority and then approved by the Department pursuant to 310 CMR 15.284.

   B. No reduction in the required four feet of naturally occurring pervious material is allowed unless the Applicant has demonstrated that the four foot requirement cannot be met anywhere on the site; that easements to adjacent property on which a system in compliance with the four foot requirement could be installed have been requested but cannot be obtained; and that a shared system is not feasible. Any such reduction must be approved by the approving authority and then approved by the Department pursuant to 310 CMR 15.284.

   C. Where full compliance with all of the minimum set back distances in 310 CMR 15.211 is not feasible, the approving authority may allow a reduction under a local upgrade approval in accordance with 310 CMR 15.405 (1) (a), (b), (f), (g), and (h).

   D. Where full compliance with all of the minimum set back distances in 310 CMR 15.211 is not feasible, even taking into account provisions for local upgrade approval as described above, then pursuant to 310 CMR 15.410, the applicant must obtain variance(s) from the approving authority and then approved by the Department.

2. Reduction of the Required Separation Distance to High Groundwater Elevation – In approving design and installation of the System by a particular Applicant, the approving authority may allow a reduction in the required separation between the bottom of the stone underlying the SAS and the high groundwater elevation, provided that all of the following conditions are met:

   A. A minimum two-foot separation (in soils with a recorded percolation rate of more than two minutes per inch) or a minimum three-foot separation (in soils with a recorded percolation rate of two minutes or less per inch) between the bottom of the stone underlying the SAS and the high groundwater elevation is maintained.

   B. No reduction in the required SAS size is allowed unless such a reduction is approved by the approving authority and then approved by the Department pursuant to 310 CMR 15.284.

C. No reduction in the required four feet of naturally occurring pervious material is allowed unless the Applicant has demonstrated that the four foot requirement cannot be met anywhere on the site; that easements to adjacent property on which a system in compliance with the four foot requirement could be installed have been requested but cannot be obtained; and that a shared system is not feasible. Any such reduction must be approved by the approving authority and then approved by the Department pursuant to 310 CMR 15.284.

D. Where full compliance with all of the minimum set back distances in 310 CMR 15.211 is not feasible, the approving authority may allow a reduction under a local upgrade approval in accordance with 310 CMR 15.405 (1) (a), (b), (f), (g), and (h).

E. Where full compliance with all of the minimum set back distances in 310 CMR 15.211 is not feasible, even taking into account provisions for local upgrade approval as described above, then pursuant to 310 CMR 15.410, the applicant must obtain variance(s) from the approving authority and then approved by the Department.

3. Reduction of the Requirement for Four Feet of Naturally Occurring Pervious Material –In approving design and installation of the System by a particular Applicant, the approving authority may allow a reduction in the required four feet of naturally occurring pervious material in an area with no less than two feet of naturally occurring pervious material, provided that all of the following conditions are met:

A. The Applicant has demonstrated that the four foot requirement cannot be met anywhere on the site; and that easements to adjacent property on which a system in compliance with the four foot requirement could be installed have been requested but cannot be obtained; and that a shared system is not feasible.

B. No reduction in the required SAS size is allowed unless such a reduction is first approved by the approving authority and then approved by the Department pursuant to 310 CMR 15.284.

C. No reduction in the required separation (four feet in soils with a recorded percolation rate of more than two minutes per inch or five feet in soils with a recorded percolation rate of two minutes or less per inch) between the bottom of the stone underlying the SAS and the high groundwater elevation is allowed unless such a reduction is first approved by the approving authority and then approved by the Department pursuant to 310 CMR 15.284.

D. Where full compliance with all of the minimum set back distances in 310 CMR 15.211 is not feasible, the approving authority may allow a reduction under a local upgrade approval in accordance with 310 CMR 15.405 (1) (a), (b), (f), (g), and (h).

E. Where full compliance with all of the minimum set back distances in 310 CMR 15.211 is not feasible, even taking into account provisions for local upgrade approval

as described above, then pursuant to 310 CMR 15.410, the applicant must obtain variance(s) from the approving authority and then approved by the Department.

IV. General Conditions

1. All provisions of 310 CMR 15.000 are applicable to the use of this System, the System owner and the Company, except those that specifically have been varied by the terms of this Approval.

2. Any required sample analysis shall be conducted by an independent U.S. EPA or DEP approved testing laboratory, or a DEP approved independent university laboratory. It shall be a violation of this Approval to falsify any data collected pursuant to an approved testing plan, to omit any required data or to fail to submit any report required by such plan.

3. The facility served by the System and the System itself shall be open to inspection and sampling by the Department and the local approving authority at all reasonable times.

4. In accordance with applicable law, the Department and the local approving authority may require the owner of the System to cease operation of the system and/or to take any other action as it deems necessary to protect public health, safety, welfare and the environment.

5. The Department has not determined that the performance of the System will provide a level of protection to public health and safety and the environment that is at least equivalent to that of a sewer system. No System shall be installed, upgraded or expanded, if it is feasible to connect the facility to a sanitary sewer, unless as allowed by 310 CMR 15.004. When a sanitary sewer connection becomes feasible, the facility served by the System shall be connected to the sewer, within 60 days of such feasibility, and the System shall be abandoned in compliance with 310 CMR 15.354, unless a later time is allowed, in writing, by the approving authority.

6. Design, installation and operation shall be in strict conformance with the Company's DEP approved plans and specifications, 310 CMR 15.000 and this Approval.

7. Pressure distribution designed in accordance with Department guidance is required for all installations of the System.

V. Conditions Applicable to the System Owner

1. The System is approved for the treatment and disposal of sanitary sewage only. Any wastes that are non-sanitary sewage generated or used at the facility served by the System shall not be introduced into the System and shall be lawfully disposed.

2. Effluent discharge concentrations shall meet or exceed secondary treatment standards of 30 mg/L biochemical oxygen demand (BOD_5) and 30 mg/L total suspended solids (TSS). The effluent pH shall not be less than 6.0 or more than 9.0.

3. All samples shall be taken at a flowing discharge point, i.e. distribution box, pipe entering a pump chamber or other Department approved location from the treatment unit. Any required influent sample shall be taken at a point that will provide a representative sample of the influent. Influent sampling locations shall be determined by the system designer, subject to written approval by the Department

4. Operation and Maintenance Agreement:

   A. Throughout its life, the owner shall operate and maintain the System in accordance with Company's and designer's operation and maintenance requirements and this Approval. To ensure proper operation and maintenance (O&M), the owner shall enter into an O&M agreement. No O&M agreement shall be for less than one year.

   B. No System shall be used until an O&M agreement is submitted to the approving authority which:

      a Provides for the contracting with the Company or its approved management company, trained by the Company as provided in Section VI (7), to operate the System consistent with the System's specifications and the operation and maintenance requirements specified by the designer and any specified by the Department;

      b Contains procedures for notification to the Department and the local board of health within five days of a System failure or alarm event and for corrective measures to be taken immediately;

      c Provides the name of an operator, which must be a Massachusetts certified operator if one is required by 257 CMR 2.00, that will operate and monitor the System. The operator must operate and visit the System, for the first year, at least every three months and anytime there is an alarm event recorded on the CP unit that requires a site visit to correct the problem.

      d After one year of operation and following approval of a written request in accordance with Section V (7) below, Systems with design flows of less than 2,000 GPD with an operating CP unit connected to an O&M provider shall only require an annual inspection and sampling and a site visit anytime there is an alarm event on the CP unit that requires operator attention.

5. The owner of the System shall at all times have the System properly operated and maintained in accordance with this Approval, the designer's operation and maintenance requirements and the Company's approved procedures and sampling protocols. The System owner shall notify the Department and the local approving authority in writing

within seven days of any cancellation, expiration or other change in the terms and/or conditions of their O&M agreement.

6. Prior to transferring any or all interest in the property served by the System, or any portion of the property, including any possessory interest, the owner of the System shall provide written notice of all conditions contained in this Approval to the transferee(s). Any and all instruments of transfer and any leases or rental agreements shall include as an exhibit attached thereto and made a part thereof a copy of this Approval for the System. The System owner shall send a copy of such written notification(s) to the Department and local approving authority within 10 days of such notice being given.

7. Effluent from the System serving a facility shall be monitored quarterly. At a minimum, the following parameters shall be monitored: pH, BOD_5, and TSS. After one year of monitoring and reporting and at the written request of the owner, the Department may reduce the monitoring and reporting requirements as described in section V (4)(B)(d) above.

8. By January 31st of each year for the previous year, the System owner shall submit to the approving authority all data collected in accordance with item 7, above, and an O&M checklist and a technology checklist, completed by the System operator for each inspection performed during the previous calendar year. Copies of the checklists are attached to this approval.

9. Prior to the issuance of a Certificate of Compliance for the System, the System owner shall record and/or register in the appropriate Registry of Deeds and/or Land Registration Office, a Notice disclosing both the existence of the alternative septic system subject to this Approval on the property and the Department's approval of the System. If the property subject to the Notice is unregistered land, the Notice shall be marginally referenced on the owner's deed to the property. Within 30 days of recording and/or registering the Notice, the System owner shall submit the following to the Department and the local approving authority: (i) a certified Registry copy of the Notice bearing the book and page/instrument number and/or document number; and (ii) if the property is unregistered land, a Registry copy of the owner's deed to the property, bearing the marginal reference.

10. Within fourteen days of the local approving authority's issuance of the Certificate of Compliance for the System, the owner shall submit a copy of the Certificate of Compliance to the Department.

VI. Conditions Applicable to the Company

1. By January 31st of each year, the Company shall submit a report to the Department, signed by a corporate officer, general partner or Company owner that contains information on the System, for the previous calendar year. The report shall state: the number of units of the System sold for use in Massachusetts including the installation date and date of start-up during the previous year; the address of each installed System, the owner's name and address, the type of use (e.g. residential, commercial, school, institutional) and the design

flow; and for all Systems installed since the date of issuance of this Approval, all known failures, malfunctions, and corrective actions taken and the address of each such event.

2. The Company shall notify the Director of the Watershed Permitting Program at least 30 days in advance of the proposed transfer of ownership of the technology for which this Approval issued. Said notification shall include the name and address of the proposed new owner and a written agreement between the existing and proposed new owner containing a specific date for transfer of ownership, responsibility, coverage and liability between them. All provisions of this Approval applicable to the Company shall be applicable to successors and assigns of the Company, unless the Department determines otherwise.

3. The Company shall develop and submit to the Department within 60 days of the effective date of this Approval: minimum installation requirements; an operating manual, including information on substances that should not be discharged to the System; a maintenance checklist; and a recommended schedule for maintenance of the System essential to consistent successful performance of the installed Systems.

4. The Company shall develop and submit to the Department within 60 days of the effective date of this Approval a standard protocol essential for consistent and accurate measurement of performance of installed Systems, including procedures for sample collection and analysis of the System. The protocol shall be in accordance with the latest edition of Standard Methods for the Examination of Water and Wastewater.

5. The Company shall make available, in print and electronic format, the referenced procedures and protocol in paragraphs 3 and 4 directly above to owners, operators, designers and installers of the System.

6. The Company shall submit to the Department within 60 days of the effective date of this Approval a complete manual on operation of the CP unit and the procedures that shall be implemented to conduct remote monitoring and control of the Systems and the procedures that will be implemented when remote control is not possible. The Company shall also provide the Department with procedures that staff can use to access the CP unit system.

7. The Company shall institute and maintain a program of operator training and continuing education, as approved by the Department. The company shall update the list of qualified operators and make the list known to users of the technology.

8. The Company or its designee shall conduct an intended use review of the System prior to the sale of any nonresidential unit and any AX-100 units to ensure that the proposed use of the System is consistent with the unit's capabilities.

9. The Company shall furnish the Department any information that the Department requests regarding the System within 21 days of the receipt of that request.

10. The Company shall include copies of this Approval and the procedures and protocol described in Section VI (3) and (4) with each System that is sold. In any contract executed by the Company for distribution or re-sale of the System, the Company shall

require the distributor or re-seller to provide each purchaser of the System with copies of this Approval and the procedures and protocol described in Section VI (3) and (4).

11. If the Company wishes to continue this Approval after its expiration date, the Company shall apply for and obtain a renewal of this Approval. The Company shall submit a renewal application at least 180 days before the expiration date of this Approval, unless written permission for a later date has been granted in writing by the Department. This approval shall continue in force until the Department has acted on the renewal application.

VII. Reporting

1. All notices and documents required to be submitted to the Department by this Approval shall be submitted to:

Director
Watershed Permitting Program
Department of Environmental Protection
One Winter Street - 6th floor
Boston, Massachusetts 02108

VIII. Rights of the Department

1. The Department may suspend, modify or revoke this Approval for cause, including, but not limited to, non-compliance with the terms of this Approval, non-payment of the annual compliance assurance fee, for obtaining the Approval by misrepresentation or failure to disclose fully all relevant facts or any change in or discovery of conditions that would constitute grounds for discontinuance of the Approval, or as necessary for the protection of public health, safety, welfare or the environment, and as authorized by applicable law. The Department reserves its rights to take any enforcement action authorized by law with respect to this Approval and/or the System against the owner, or operator of the System and/or the Company.

IX. Expiration Date

1. Notwithstanding the expiration date of this Approval, any System sold and installed prior to the expiration date of this Approval, and approved, installed and maintained in compliance with this Approval (as it may be modified) and 310 CMR 15.000, may remain in use unless the Department, the local approving authority, or a court requires the System to be modified or removed, or requires discharges to the System to cease.